CLAIMS

1. A method for forming at least one integrated transistor device on a substrate, comprising:

   placing an energy absorbing layer above the substrate;

   forming a semiconductor layer above the energy absorbing layer;

   forming a control electrode above the semiconductor layer;

   forming first and second current electrodes within the semiconductor layer to form a semiconductor device above the energy absorbing layer;

   exposing the energy absorbing layer to an energy source to raise a temperature of the energy absorbing layer; and

   making the first and second current electrodes electrically active by receiving heat from the energy absorbing layer at a bottom surface of the first and second current electrodes.

2. The method of claim 1 further comprising:

   controlling the energy source to allow heat to substantially melt the first and second current electrodes while not melting the control electrode.

3. The method of claim 1 wherein the forming of the semiconductor layer further comprises forming the semiconductor layer by bonding the semiconductor layer to the energy absorbing layer.

4. The method of claim 1 further comprising:

using an energy source that is a light source having a wavelength of approximately 800 nanometers or more.

5. The method of claim 1 further comprising:

using an energy source that has a wavelength that substantially passes through the first and second current electrodes and the control electrode but that is substantially absorbed by the energy absorbing layer.

6. The method of claim 1 further comprising:

exposing the energy absorbing layer to the energy source by positioning the energy source to be either above the integrated transistor device or below the substrate.

7. The method of claim 1 further comprising forming the energy absorbing layer from at least one of titanium, cobalt, tungsten, tantalum, zirconium and carbon.

8. The method of claim 1 further comprising forming the semiconductor layer having at least one of silicon, germanium and gallium arsenide.

9. The method of claim 1 further comprising providing an insulating layer between the energy absorbing layer and the control electrode to impede conduction of heat from the energy absorbing layer to the control electrode.

10. The method of claim 1 further comprising implementing the substrate as an insulator.

11. The method of claim 1 further comprising forming an adhesion layer between the energy absorbing layer and the semiconductor layer for connecting the semiconductor layer to the energy absorbing layer.

12. The method of claim 1 further comprising:

electrically isolating the at least one integrated transistor device in a lateral direction by forming an insulating region adjacent a lateral edge of the energy absorbing layer, the semiconductor layer and one of the first and second current electrodes.

13. A method of electrically activating predetermined regions of a transistor comprising:

forming first and second current electrodes within a substrate and a control electrode overlying the substrate;

forming an energy absorbing layer beneath the first and second current electrodes and the control electrode;

absorbing energy from an energy source with the energy absorbing layer, the energy having a wavelength sufficient to permit the energy to pass through the first and second current electrodes and control electrode without being substantially absorbed; and

heating the first and second current electrodes substantially to a melting temperature without melting the control electrode by using the energy that was absorbed by the energy absorbing layer.

14. The method of claim 13 further comprising:

electrically isolating the energy absorbing layer from other regions by containing the energy absorbing layer within a predetermined lateral region that includes a lateral dimension of the transistor.

15. The method of claim 13 further comprising processing the first and second current electrodes to comprise amorphous silicon and processing a portion of the control electrode to comprise silicon having a higher melting temperature than the first and second current electrodes.

16. A semiconductor device on a substrate comprising:

an energy absorbing layer having a first surface adjoining the substrate and having a second surface, the energy absorbing layer comprising a material that permits the energy absorbing layer to receive energy of predetermined wavelength and convert the energy to heat by absorbing the energy;

a semiconductor layer overlying the energy absorbing layer; and

a semiconductor electrode contained within the semiconductor layer, the semiconductor electrode being made electrically active from the heat provided by the energy absorbing layer.

17. The semiconductor device of claim 16 wherein the substrate further comprises:

an insulator wherein the semiconductor device is a silicon on insulator (SOI) device.

18. The semiconductor device of claim 16 further comprising:

an insulating region adjacent the energy absorbing layer, the semiconductor layer and the semiconductor electrode, the insulating region providing electrical isolation of the semiconductor device and the energy absorbing layer.

19. The semiconductor device of claim 16 further comprises a transistor, the transistor comprising:

a control electrode above the semiconductor layer; and

first and second current electrodes within the semiconductor layer, one of the first and second current electrodes being the semiconductor electrode.

20. The semiconductor device of claim 16 further comprising:

an adhesion layer connected to the energy absorbing layer and the semiconductor layer.

21. A method for making a semiconductor device electrically conductive, comprising:

providing a substrate;

placing an energy absorbing layer above the substrate;

forming a semiconductor layer above the energy absorbing layer;

forming a region within the semiconductor layer having a top surface and a bottom surface, the bottom surface being closer to the energy absorbing layer than the top surface, the region having a resistivity above 0.1 ohm-centimeter;

exposing the energy absorbing layer to an energy source to raise a temperature of the energy absorbing layer; and

reducing the resistivity to below 0.001 ohm-centimeter and thereby making the region electrically conductive by receiving heat at a bottom surface of the region and from the energy absorbing layer.